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If an able essay is written in the state of California showing that morality is a social obligation, there should be some means of bringing that idea to the notice of all the people. How could these things be done? For answer we may ask, how does the Department of Agriculture utilize the ideas of scientific men? If we establish experiment stations to discover means of conserving our material resources, why should we not establish experimental schools to test the usefulness of ideas directed toward the problem of social betterment?

Experimental schools under the supervision of a Department of Education would certainly be more productive of good from the very first than the occasional model school here and there through the country, for at least these three reasons: because the literature of all previous experiments in all countries would be at their immediate command, because the ideas of a nation's teachers would flow to it naturally, and because the successes and, equally important, the failures could always be matters of public knowledge.

We need better and more productive methods of school administration than those commonly employed. To this end national experimental schools could "try out" the various ideas along democratic lines that have come in our effort to free ourselves from the autocratic domination of one or a few strong or unprincipled men in control of systems of schools. Moreover, the classical, the scientific and the "practical" subjects must be analyzed as to the character of subject-matter, and experimented with for results. We have the dictum of the middle ages that the classical languages bring culture to the mind of the learner. Are there not other subjects which may yield the product of culture? Again, teachers of the natural sciences have long claimed a monopoly of material which on being studied trains students to think. We who are in the work must soon acknowledge that we have not proved our case. The explanation of failure may lie in the possibility of our not knowing how to handle our material. There can be no question that the natural sciences do present the opportunity for training to thinking. Na-

tional experimental schools could take up the discoveries in methods made by isolated teachers of science, and make them productive of good to great numbers of the younger generation of citizens. The help to a nation of generally non-thinking people might be enormous.

National experimental schools covering all the work from kindergarten to college should be established in various parts of the country, for the benefit of the local schools and to the profit of the national schools themselves. For administrative as well as for pedagogical and social reasons, these schools should offer, for example in the secondary grade, *all* the subjects now taught in the classical or special high schools. Only through the organization of this, a cosmopolitan high school, could comparative results be obtained.

In this connection we should not fail to consider the expense of possibly a score of national schools. For that we could draw on the credit of the future to the extent of the cost of a few "dreadnoughts."

HENRY R. LINVILLE

JAMAICA, N. Y.

THE ASSOCIATION OF AMERICAN CHEMICAL
RESEARCH LABORATORIES

TO THE EDITOR OF SCIENCE: Permit me, Sir, to correct an error in my letter printed in SCIENCE, issue of November 5, 1909. Among the laboratories which had, at the Clark University celebration meeting on September 16, joined the newly formed Association of American Chemical Research Laboratories, my letter mentioned that of Harvard University. This is due to a misunderstanding. Professor Richards, the chairman of the department, while "believing most heartily in the spirit and idea" of the association, had not explicitly pledged the Harvard laboratory to join it, and now the director of the laboratory, Professor Sanger, who has charge of all business matters, has definitely decided against adding the laboratory to the association list, in the belief that this would be contrary to "the terms under which our chemicals and apparatus are imported duty free."

I have thought it scarcely necessary to point out that the borrowing of supplies by educa-

tional institutions from one another is by no means an innovation, and its legality seems out of serious question. At any rate, the function of the new association is merely, through its secretary, to *inform* members as to where they can *borrow* (if they like) urgently needed research chemicals while waiting for them to arrive from Germany. I have received a number of letters prophesying usefulness for the undertaking.

M. A. ROSANOFF,
Secretary

CLARK UNIVERSITY,
WORCESTER, MASS.,
November 20, 1909

THE CIVILIZATION OF BOHEMIA

TO THE EDITOR OF SCIENCE: In the first paragraph of the address by Dr. M. Toch, on the first page of SCIENCE, of November 19, there occurs a certain generalization on the effects of illiteracy in several European countries. The writer says: "In many of the countries of Europe illiteracy is universal"—which, of course, is not correct itself. And this is followed further on, as in illustration of the effects of the illiteracy, by the sentence: "What have those countries like Roumania, Bulgaria, *Bohemia* (italics my own), Hungary, Russia and dozens of others, ever amounted to, and what are their commercial relations with the rest of the world, compared with Germany, France, England or the United States?" Now all I desire is to say a word regarding Bohemia, which is the land of my birth. The inclusion of that country in the above sentence is extremely unjustifiable, for as any statistics on that question, including the data of the U. S. Bureau of Immigration, will show, Bohemia leads all the countries of Europe, including the greater part of Germany, in the lowness of the percentage of the illiterate, these being practically reduced to the defectives. And as to whether that country ever amounted or now amounts to anything in the sciences, arts, industries, etc., it is sufficient to refer to history and to the commercial and tax statistics of the Austrian empire. In view of these facts the above statement must be characterized as a very

loose one and it is regrettable that it found place in this esteemed journal.

ALEŠ HRDLÍČKA

WASHINGTON, D. C.,

November 19, 1909

MARS AS THE ABODE OF LIFE

TO THE EDITOR OF SCIENCE: On page 339 of SCIENCE I notice "2" has been printed for "r" in the denominator of the right side of the formula in the middle of the page. It reads correctly in my copy of the proof. The thing is evident as a misprint to any mathematician from the deductions—but it may as well be stated.

PERCIVAL LOWELL

QUOTATIONS

THE U. S. NAVAL OBSERVATORY

THE President's recommendation concerning the Naval Observatory is eminently sound. He urges that the official head of that great astronomical establishment should be an eminent astronomer, and not a naval officer detailed for service for a shorter or longer term. This mode of filling the post of head of the observatory could not have survived so long as it has were it not for the entirely false notion conveyed in the name of the institution. As the President truly says, all the uses of the observatory specifically related to the needs of the navy might be subserved at a small fraction of the cost involved in the maintenance of the Naval Observatory. The part it really plays is that of a great national observatory, and its material equipment is of a character befitting such a part. The President calls it "the most magnificent and expensive astronomical establishment in the world." Alongside its important observational work is carried on the Nautical Almanac, in connection with which the labors of Simon Newcomb and of George W. Hill have made American mathematical astronomy illustrious the world over. The whole of this activity should, as a matter of course, be presided over by an astronomer of the first rank, under a permanent tenure, and not by a man who, in the nature of the case, must be comparatively an amateur, and who is likely to look upon the post as a pleasant berth